

Application No.: 10/811,899

REMARKS

This Amendment is being filed in response to the Office Action dated January 24, 2007.

In view of these amendments and remarks this application should be allowed and the case passed to issue. No new matter is introduced by this amendment. Support for the amendments to claims 1, 8, and 10 is found throughout the specification as originally filed, including paragraphs [017] and [029]. Claims 2-7 and 9 are amended to correct informalities and further clarify the claims.

Claims 1-10 are pending this application. Claims 1-10 are rejected. Claims 1-10 have been amended in this response.

Objections to the Specification

The disclosure was objected to because of informalities. This objection is traversed, and reconsideration and withdrawal thereof respectfully requested.

The specification has been amended to correct the asserted informalities.

Objections to the Claims

Claims 2 and 5 were objected to because of informalities. This objection is traversed, and reconsideration and withdrawal thereof respectfully requested.

Claims 2 and 5 have been amended to correct the asserted informalities.

Claim Rejections Under 35 U.S.C. § 102

Claims 1-7 and 10 were rejected under 35 U.S.C. § 102(b) as being anticipated by Kindler et al. (U.S. Pat. No. 6,440,594).

Claims 8 and 9 were rejected under 35 U.S.C. § 102(e) as being anticipated by Kanno (U.S. Pat. Pub. No. 2003/0017375).

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These rejections are traversed, and reconsideration and withdrawal thereof respectfully requested. The following is a comparison between the present invention, as claimed, and the cited prior art.

An aspect of the invention, per claim 1, is a fuel cell comprising an electrode structure including a cathode, an anode and an electrolyte between the cathode and the anode. A fuel gas passage is configured to conduct fuel to the anode. An air passage is configured to conduct air to the cathode. A separator is configured to supply the fuel to the fuel gas passage and a pure water channel is configured to allow flow of pure water and permit the pure water to pass into the separator. The pure water channel includes polymers respectively having polymer chains. One end of the polymer chains are connected to a surface of the pure water channel and are capable of forming an entanglement among themselves.

Another aspect of the invention, per claim 8, is a fuel cell comprising an electrode structure including a cathode, an anode and an electrolyte between the cathode and the anode. A fuel gas passage is configured to conduct fuel to the anode. An air passage configured to conduct air to the cathode. A pure water channel is configured to allow flow of pure water and permit the pure water to pass into the separator. The fuel cell further comprises a means for discharging the pure water in the pure water channel to outside of the fuel cell when the fuel cell is shut down.

Another aspect of the invention, per claim 10, is a method of operating a fuel cell having a water channel with a polymeric material contained therein and a separator for supplying fuel to the fuel cell. The method comprises permitting water to flow through the channel and pass into the separator when operating the cell and holding the water in the polymeric material when the cell is not operating.

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The Examiner asserted that Kindler et al. disclose the claimed fuel cell and method of operating a fuel cell. The Examiner interpreted the water channel recited in the claims as being the reactant flow channel in the separator of the fuel cell, where the product water or water in the reactant gas flows out the reactant flow channel of the separator plate. As regards Kanno, the Examiner averred that Kanno discloses a fuel cell system that prevents water from freezing including a cooling water pump for circulating the cooling water in the cooling water channel.

Kindler et al. and Kanno, however, do not anticipate the claimed fuel cell and method for operating a fuel cell because Kindler et al. do not disclose a separator configured to supply the fuel to the fuel gas passage and a pure water channel configured to allow flow of pure water and permit the pure water to pass into the separator, as required by claim 1; and a fuel cell having a water channel with a polymeric material contained therein and a separator for supplying fuel to the fuel cell and permitting water to flow through the channel and pass into the separator when operating the cell, as required by claim 10; and Kanno does not disclose a separator configured to supply the fuel to the fuel gas passage, and a pure water channel configured to allow flow of pure water and permit the pure water to pass into the separator, as required by claim 8.

As explained above, the Examiner interpreted the claimed water channel as being the reactant flow channel in the separator of the fuel cell, where the product water or water in the reactant gas flows out the reactant flow channel of the separator plate. The pure water channel as recited in claims, however, is distinguishable from a flow channel for fuel in a separator plate. The pure water channel required by the present claims is provided in addition to the separator. The reactant flow channel of Kindler et al. is provided in the separator plate, not separately therefrom.

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For the foregoing reasons, the pure water channel as required by claims 1 and 10 is an element distinguishable from a flow channel in the separator. Therefore, Kindler et al. fail to disclose the limitations: "*a pure water channel configured to allow flow of pure water and permit the pure water to pass into the separator,*" required by claim 1 and "*permitting water to flow through the channel and pass into the separator when operating the cell,*" required by claim 10.

Kanno is silent about fuel cell separators. For example, it is noted that none of the Figures in Kanno show a separator. As Kanno fails to disclose a separator, Kanno further cannot disclose a "*a pure water channel configured to allow flow of pure water and permit the pure water to pass into the separator,*" as required by claim 8.

The factual determination of lack of novelty under 35 U.S.C. § 102 requires the disclosure in a single reference of each element of a claimed invention. *Helifix Ltd. v. Blok-Lok Ltd.*, 208 F.3d 1339, 54 USPQ2d 1299 (Fed. Cir. 2000); *Electro Medical Systems S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994); *Hoover Group, Inc. v. Custom Metalcraft, Inc.*, 66 F.3d 399, 36 USPQ2d 1101 (Fed. Cir. 1995); *Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992); *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051 (Fed. Cir. 1987). Because Kindler et al. do not disclose a separator configured to supply the fuel to the fuel gas passage and a pure water channel configured to allow flow of pure water and permit the pure water to pass into the separator, as required by claim 1; and a fuel cell having a water channel with a polymeric material contained therein and a separator for supplying fuel to the fuel cell and permitting water to flow through the channel and pass into the separator when operating the cell, as required by claim 10, Kindler et al. do not anticipate claims 1 and 10.

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Because Kanno does not disclose a separator configured to supply the fuel to the fuel gas passage, and a pure water channel configured to allow flow of pure water and permit the pure water to pass into the separator, as required by claim 8, Kanno does not anticipate claim 8.

Applicant further submits that Kindler et al. and Kanno, whether taken alone, or in combination, do not suggest the claimed fuel cells and method of operating a fuel cell. The dependent claims are allowable for at least the same reasons as the respective independent claims from which they depend and further distinguish the claimed stacked battery.

In view of the above amendments and remarks, Applicants submit that this application should be allowed and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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